NOVAK CONVERSIONS

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TRANSFER CASE CABLE SHIFTER

INSTALLATION GUIDE

For Novak Kits #SK2XC and #SK2XZ

Covers:

#SK2XC — Jeep Wrangler TJ, Cherokee XJ & Comanche MJ
#SK2XZ — Jeep Grand Cherokee ZJ
NP231 & NP242 transfer cases with the factory “dog-leg” floor shifter



Novak #SK2XC cable shifter kit *(Fig. 1)*

BEFORE YOU START

1. Read this entire guide before beginning, and check your kit against the contents list in Section 1.
2. The whole installation is done with the transfer case **and** the shift handle in **2-High**. Shift into 2-High first and leave it there until the cable is connected.
3. Save the factory sector shaft locknut and the transfer case anchor bracket nuts — they are reused.

WATCH THE INSTALLATION VIDEO

This guide is best used alongside our installation video. Scan the QR code with your phone to watch a Novak technician install this shifter step by step.

https://youtu.be/NLbI1XxgL3c

1 — KIT CONTENTS

Lay out and check all parts before you begin. If anything is missing, contact Novak before starting the installation.

Qty	Description
1	Body (floor) mounting bracket
1	Transfer case anchor bracket ("Z" bracket)
1	Control cable assembly, with housing nuts & washers
4	Bolt, Allen button head, 1/4" × 1"
4	Rivnut, rubber with brass insert
1	Bolt, Allen button head, 1/4" × 1-1/2" *
1	Spacer *
1	Clevis assembly (clevis, clevis pin, cotter pin)
1	Shifter extension, with 5/16" bolt & washer *
1	Instructions

** Used only on some Jeeps. See Section 6.1 (spacer and long bolt) and Section 7.3 (shifter extension).*

> **NOTE:** The factory sector shaft locknut and the two transfer case anchor studs and nuts are reused. They are not included in the kit.

2 — INTRODUCTION

About This Kit

The Novak #SK2XC and #SK2XZ kits replace the factory "Z-bar" transfer case linkage with a single, Teflon-lined push-pull cable. The result is a smoother, more positive shift than the factory linkage, and the cable adjusts for nearly any modification: suspension lifts, body lifts, tummy tucks, powertrain conversions and more.

Applications

Kit	Vehicle
#SK2XC	Jeep Wrangler TJ, Cherokee XJ, Comanche MJ
#SK2XZ	Jeep Grand Cherokee ZJ

Both kits fit the **NP231** (NP231J / NP231AMC) and **NP242J** transfer cases used in these Jeeps, along with other Jeeps that have been fitted with the factory TJ/XJ "dog-leg" floor shifter. If you are fitting a 231 or 242 to a different Jeep, install a TJ or XJ style shift lever assembly first.



NP231J *(Fig. 2)*



NP242J *(Fig. 3)*

Why a Cable Shifter?

The New Process chain-drive transfer cases use a simple, smooth-rotating shift plate on the side of the case. The factory connects that plate to the shift handle with a Z-bar linkage — a maze of rods, joints and brackets that wear, bind and fall out of adjustment, especially after a lift or drivetrain swap.

The Novak kit removes the Z-bar linkage entirely and connects the shift handle straight to the shift plate with one flexible, low-friction cable. There are no intermediate joints to wear out.

Note to the Installer

This guide and the use of any Novak product assume a safe, working knowledge of the automotive systems involved. Novak cannot know the skill level of every installer or publish every fundamental needed for these procedures. It is up to the customer to decide whether the work is within their expertise or whether they should get help.

> **NOTE:** Novak products and procedures are intended and recommended for off-road use only.

3 — TOOLS & SUPPLIES

Required

1. Open-end and box-end wrench set, including **9/16"**
2. Socket set with ratchet and extensions
3. Hex (Allen) key set
4. Torque wrench (in. lbs. and ft. lbs.)
5. Utility knife
6. Pliers (for the cotter pin)
7. Floor jack and jack stands
8. Strong tape (duct tape), if you are working alone

Optional

- Angle finder (to check the shift handle in Section 5.2)
- An assistant inside the Jeep (for Section 6.1)
- Tri-Flow or silicone spray lubricant

4 — SAFETY PRECAUTIONS

> **WARNING:** Never work under a Jeep supported only by a jack. Use jack stands on level, solid ground and chock the wheels.
>
> **WARNING:** If you remove the crossmember, support the transmission with a floor jack and jack stand **before** removing any crossmember bolts.

> **CAUTION:** Wear safety glasses. Rust and debris fall from the underside of the tunnel and the transfer case.

5 — REMOVING THE FACTORY LINKAGE

5.1 — Preparation

1. Park on level ground, chock the wheels, then raise the Jeep and support it securely on jack stands.
2. Shift the transfer case into **2-High**. If it resists, rotate a driveshaft slightly by hand while shifting.



Factory TJ shift handle — 2H, 4H, N, 4L *(Fig. 4)*

> **NOTE:** Leave the transfer case in 2-High for the rest of the installation. The cable is set up in this position.

5.2 — Check the Factory Shift Handle Angle

More than 95% of TJ, XJ, MJ and ZJ shift handles were made consistently, but a small number left the factory with the bellcrank bent at the wrong angle. On the assembly line, the Z-linkage was simply adjusted to hide the error — but a mis-bent handle loses leverage and throw, causing shifting problems that are otherwise hard to explain. Now is the time to correct it.

Check the bellcrank visually against the photos below, or with an angle finder:

Range	Bellcrank angle (approx.)
2-High	110° down from horizontal (20° rearward of vertical)
4-Low	60° down from horizontal (30° forward of vertical)



2-High: ~110° *(Fig. 5)*



4-Low: ~60° *(Fig. 6)*

If the angles do not match, remove the shift lever assembly and carefully bend the bellcrank to match the **full-size template on the last page** of this guide. Return the transfer case to 2-High when finished.

5.3 — Crossmember (Optional)

Removing the crossmember gives you much more working room, but is not always necessary. If you remove it, support the transmission with a floor jack and jack stand first.

5.4 — Remove the Z-Bar Linkage

1. Remove the entire Z-bar linkage between the factory shift handle and the transfer case shift lever.
2. Remove the rubber grommet from the shift handle lever. Cutting it out with a knife is often the easiest way.



Cutting out the factory grommet *(Fig. 7)*

5.5 — Remove the Factory Floor Plate

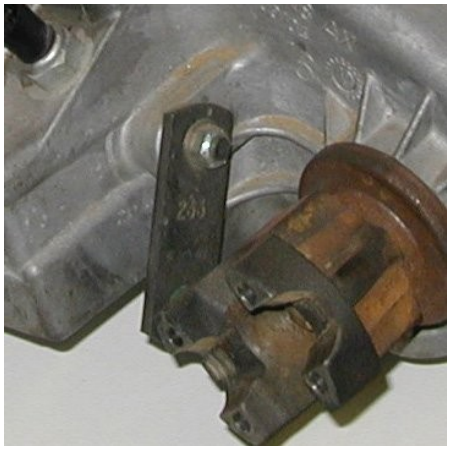
1. Lift the carpet inside the Jeep to reach the floor plate bolts.
2. Remove the factory linkage plate from the underside of the tunnel.

5.6 — Remove the Factory Anchor Bracket

1. Remove the two transfer case adapter nuts (3/8" studs) that hold the factory anchor bracket, typically at the **1 o'clock and 3 o'clock** positions.
2. Remove the bracket. Save the nuts for reuse.

5.7 — Remove the Factory Sector Shaft Plate

1. Using a **9/16"** box-end wrench or socket, remove the nut from the transfer case sector shaft (shift rotator) plate.
2. Remove the plate. A little prying or side force against the plate will help.



Sector shaft (shift rotator) plate and nut *(Fig. 8)*

> **NOTE:** Keep the factory locknut. It secures the new Novak shift rotator plate.

6 — INSTALLING THE NOVAK SHIFTER

6.1 — Body (Floor) Bracket

The bracket's hole pattern only fits one way. The cable tab faces **forward**.



Body bracket with rubber rivnuts installed *(Fig. 9)*

1. Insert the four rubber rivnuts into the bracket with the rubber pads facing the body and the brass inserts facing the transmission.
2. Align the bracket and rivnuts with the four holes in the tunnel, in the same location as the factory plate.
3. From inside the Jeep, install the four 1/4" × 1" stainless button head bolts into the rivnuts. An assistant can hold the bracket from below; if you are working alone, tape the bracket to the tunnel.
4. Tighten the bolts evenly. Hold or tape the rivnuts to the bracket if they spin, until they flare enough to grip on their own.

> **TORQUE:** Body bracket bolts: 1.6 N·m (1.2 ft. lbs. / 14 in. lbs.)

> **TIP:** When correctly tightened, about **5 to 6 threads** of each bolt will show below the rivnut. Do not over-tighten.



Bolts installed from inside the cab *(Fig. 10)*



Body bracket installed (TJ shown; XJ, MJ & ZJ similar) *(Fig. 11)*

> **NOTE:** Rarely, a Jeep's tunnel shape keeps the bracket from seating fully. If so, use the supplied **spacer** and the **1/4" × 1-1/2" bolt** in that location.

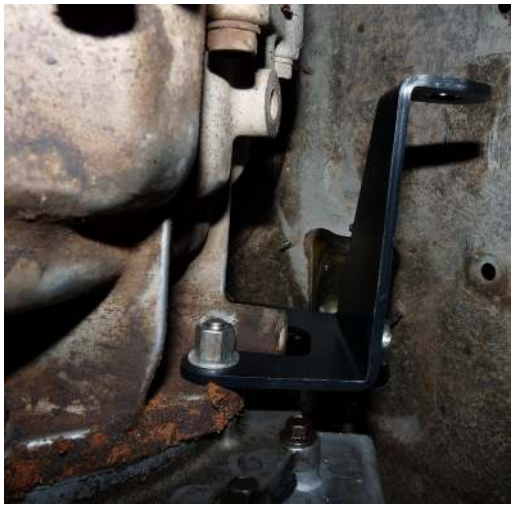


Spacer and long bolt for tunnel variation *(Fig. 12)*

6.2 — Transfer Case Anchor Bracket

1. Install the "Z" shaped anchor bracket on the same two transfer case studs the factory bracket was removed from.
2. Reinstall the factory nuts and tighten.

> **TORQUE:** Anchor bracket nuts: 52 N·m (38 ft. lbs.) — or as tight as you can comfortably pull a standard-length 9/16" box-end wrench.



Anchor bracket installed *(Fig. 13)*

6.3 — Novak Shift Rotator Plate

1. Confirm the transfer case is still in **2-High**. This puts the sector shaft in its most downward and forward position.
2. Install the Novak shift rotator (sector shaft) plate angled **down and forward**.
3. Secure it with the factory locknut.

TORQUE: Sector shaft locknut: 41 N·m (30 ft. lbs.)



Novak rotator plate installed, down and forward *(Fig. 14)*

6.4 — Connect the Cable to the Shift Handle

NOTE: Before you start this step, verify that the transfer case is in 2-High **and** the shift handle is in 2-High (all the way forward). Do not move either one until the clevis is installed in Section 6.6.

1. At the shift handle end of the cable, remove one housing nut and washer. Spin the remaining nut to about the middle of the threaded housing.
2. Feed the cable **rearward** through the hole in the body bracket tab. Slip the washer on and spin on the nut. Do not tighten yet.
3. Bolt the cable's bearing end to the shift handle lever plate with the supplied nut and washers. The bearing end sits **outboard** of the lever plate.



Bearing end and lever *(Fig. 15)*



Bearing end installed outboard *(Fig. 16)*

4. Without moving the lever or putting tension on the cable, spin the two housing nuts so they sandwich the bracket tab. Tighten them against the tab with an open-end wrench. Little or no adjustment is normally needed here.



Cable housing secured to the body bracket tab *(Fig. 17)*

6.5 — Route the Cable to the Anchor Bracket

1. At the transfer case end of the cable, remove one housing nut and washer. The cable is now pointing forward.
2. Loop the cable rearward and feed the threaded housing through the hole in the anchor bracket tab.
3. Slip on the washer and spin on the nut. Set the nuts near the middle of the threaded housing so you have adjustment in both directions. Do not fully tighten yet.



Cable looped rearward toward the transfer case *(Fig. 18)*

NOTE: Do not kink the cable, but don't worry about a bend that looks tight. This high-grade, low-friction cable operates reliably for years with a bend radius as small as **5 inches**.



Cable housing at the anchor bracket tab *(Fig. 19)*

6.6 — Install the Clevis

1. Remove the cotter pin and clevis pin from the clevis.
2. Thread the clevis onto the cable end sticking out of the anchor bracket. Sight upward to line it up with the hole in the rotator plate.
3. Put the clevis pin in the clevis and try it in the rotator plate hole. Turn the clevis in or out in **1/2-turn** steps until the pin slides through with **no tension** on the cable or the rotator plate. The clevis head can face inboard or outboard.
4. Insert the cotter pin through the clevis pin and bend its legs to lock it.
5. Tighten the cable housing nuts against the anchor bracket tab.



Clevis on cable end *(Fig. 20)*



Clevis pinned to rotator plate *(Fig. 21)*

7 — TESTING & ADJUSTMENT

7.1 — Test Shift

1. With the wheels off the ground and the Jeep securely on jack stands, shift into each range and mode. Turn the driveshafts by hand to help each gear engage.
2. Check that the shift handle position matches each detent in the transfer case, and that the transfer case fully engages **2-High** and **4-Low** at each end of the handle's travel.

7.2 — Adjusting the Cable

Little adjustment is usually needed. If required:

To…	Do this
Lengthen the cable	Turn the clevis and/or bearing end **out** a few turns — or move the housing jam nuts **away** from the cable ends.
Shorten the cable	Turn the clevis and/or bearing end **in** — or move the housing jam nuts **toward** the cable ends.

CAUTION: Keep at least **six threads of engagement** on the clevis and bearing end. Whatever you change at one end of the housing, match at the other end.

7.3 — Shifter Extension (If Needed)

Every kit includes a shifter extension for Jeeps that need more throw. Factory 231 shift handle bellcranks that measure **3-1/2"** typically do not need it. You may need the extension if:

- your Jeep has a shorter bellcrank,
- a different transfer case (such as an NP241OR) has been swapped in, or
- after adjusting the cable (Section 7.2), the transfer case still does not reach its full range.



Measuring the shift handle bellcrank *(Fig. 22)*

1. Fit the extension's pocket over the bellcrank. Pull the pocket flank tight against the rear edge of the arm. The bolt hole has some play to allow for factory variation.
2. Holding the extension tight against the edges of the arm, install the supplied 5/16" bolt and washer. Tighten fully.
3. Thread the cable bearing end into one of the extension's threaded holes: the **upper** hole for a small amount of extra throw, or the **lower** hole for maximum throw.
4. Re-check the cable adjustment (Sections 7.1 and 7.2).



Extension fitted to bellcrank
(Fig. 23)



Extension bolted in place
(Fig. 24)

> **NOTE:** The clamping force of the graded bolt, combined with the pocket's contact area, keeps the extension from loosening.

8 — FINISHING & MAINTENANCE

Finishing

1. Reinstall the crossmember (if removed) and torque its fasteners to factory specifications.
2. Reinstall the skid plate, carpet and any other interior or factory components you removed.
3. Lower the Jeep and confirm the transfer case shifts through all ranges before driving.



Completed installation *(Fig. 25)*

Earlier-version body bracket shown. The current bracket installs the same way.

Maintenance

Component	Service
Control cable	Teflon-lined and pre-lubricated for many years. Every 5 years — or sooner after water crossings or other contamination — spray Tri-Flow down the cable and work it in.
Clevis & bearing end	Lubricate yearly with a spray lube such as Tri-Flow or silicone spray.

TORQUE SPECIFICATIONS

Fastener	N·m	ft. lbs.
Body bracket bolts (into rubber rivnuts)	1.6	1.2 (14 in. lbs.)
Transfer case anchor bracket nuts	52	38
Sector shaft (rotator plate) locknut	41	30
Shifter extension bolt (5/16")	—	Tighten fully
Crossmember fasteners	—	Factory specification

TROUBLESHOOTING

Symptom	Likely cause	Remedy
Won't fully engage 4-Low or 2-High	Cable length out of adjustment; not enough throw	Adjust per Section 7.2. If range is still short, check the shift handle angle (5.2) or install the shifter extension (7.3).
Handle position doesn't match transfer case detents	Cable connected when handle and transfer case were not both in 2-High	Put both in 2-High and re-set the clevis (6.6).
Stiff or notchy shifting	Kinked cable or bend tighter than 5"; dry joints; gears not aligned	Re-route the cable; lubricate the clevis and bearing end; turn the driveshafts while shifting.
Hard shifting or short throw with the factory handle	Shift handle bellcrank mis-bent at the factory	Compare to the template on the last page and bend as needed (5.2).
Body bracket won't sit flush against the tunnel	Tunnel shape variation	Install the supplied spacer and 1/4" × 1-1/2" bolt (6.1).
Rivnuts spin while tightening	Rivnut not yet flared	Tape or hold the rivnut to the bracket until it grips.

For technical support: (435) 753-2513 or www.novak-adapt.com/contact



Please keep these instructions for future reference. There is no final word to our instruction packages — if this guide missed a question, or you have suggestions, ideas or photos that could help future installers, please let us know.

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SHIFT HANDLE BELLCRANK TEMPLATE — PRINT AT ACTUAL SIZE (100%). DO NOT “FIT TO PAGE.”

Use this template if your TJ / XJ factory shift handle was not bent correctly at the factory (see Section 5.2).

